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Typed or Printed Name of Person Mailing Paper or Fee: Patricia Aguillon .

Signature: Patricia Aguillon



JUL 10 2001

PATENT  
Docket No. P1316

IN THE

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	BIN YU	EXAMINER:	UNASSIGNED
SERIAL NO.:	09/844,752	ART UNIT:	2812
FILED:	APRIL 27, 2001		
FOR:	MOS TRANSISTOR WITH HIGHLY LOCALIZED SUPER HALO IMPLANT		

COMMISSIONER FOR PATENTS  
OFFICE OF INITIAL PATENT EXAMINATION  
CUSTOMER SERVICE CENTER  
WASHINGTON, D.C. 20231

TRANSMITTAL LETTER

Dear Sir:

In connection with the above-referenced patent application, transmitted herewith are the following:

1. Request for Corrected Filing Receipt (2 pages);
2. Copy of Filing Receipt (4 pages);
3. Copy of Claims as filed with the application (3 pages); and
4. Post Card in acknowledgement of receipt of all transmitted materials.

Please date-stamp the enclosed post card and return same to the undersigned in acknowledgment of receipt of all transmitted materials.

Respectfully submitted,



Victor Flores  
Reg. No.29,638

VF/pa  
July 10, 2001  
LARIVIERE, GRUBMAN & PAYNE, LLP  
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Typed or Printed Name of Person Mailing Paper or Fee: Patricia Aguillon

Signature: Patricia Aguillon

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PATENT  
Docket No. P1316

IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: BIN YU

SERIAL NO.: 09/844,752 EXAMINER: UNKNOWN

FILED: APRIL 27, 2001 ART UNIT: 2812

FOR: MOS TRANSISTOR WITH HIGHLY LOCALIZED SUPER HALO  
IMPLANT

COMMISSIONER FOR PATENTS  
OFFICE OF INITIAL PATENT EXAMINATION  
CUSTOMER SERVICE CENTER  
WASHINGTON, D.C. 20231

REQUEST FOR CORRECTED FILING RECEIPT

1. Attached is a copy of the original Filing Receipt. We respectfully request issuance of a corrected filing receipt.

2. There is an error in:

X Total Claims

in that it should read as follows: **11**

In support of this request, attached is a copy of the Claims as filed with the application.

Respectfully submitted,

  
Victor Flores  
Reg. No.29,638

VF/pa  
July 10, 2001  
LARIVIERE, GRUBMAN & PAYNE, LLP  
Post Office Box 3140  
Monterey, CA 93942  
(831) 649-8800

## CLAIMS

COPY

What is claimed is:

1. A method of making a MOSFET, comprising:  
providing a substrate having a gate oxide and gate thereon;  
performing a source/drain extension implant;  
forming a spacer on the gate;  
performing epitaxy to form raised source/drain regions;  
forming a silicide on the gate and source/drain regions;  
removing the spacer;  
performing a halo implant; and  
completing the MOSFET.
2. A method as recited in claim 1, wherein the source/drain extension implant comprises an approximately vertical implant to a depth of approximately 10 nm to 30 nm of ions selected from the group consisting essentially of  $B^+$ ,  $BF_2^+$ ,  $As^+$ ,  $Sb^+$ ,  $P^+$ .
3. A method as recited in claim 1, wherein the spacer comprises a nitride.
4. A method as recited in claim 1 wherein the halo implantation comprises an approximately vertical implant to a depth of approximately 40 nm to 100 nm of ions selected from the group consisting essentially of  $B^+$ ,  $BF_2^+$ ,  $Ga^+$ ,  $In^+$ ,  $As^+$ ,  $Sb^+$ ,  $P^+$ .
5. A method of making a MOSFET, comprising:  
providing a substrate having a gate oxide and gate thereon;  
performing a vertical source/drain extension implant to a depth of approximately 10 nm to approximately 30 nm;  
forming a spacer on the gate;

forming raised source/drain regions;  
forming a silicide on the gate and source/drain regions;  
removing the spacer;  
performing a halo implant; and  
completing the MOSFET.

6. A method as recited in claim 5, wherein the spacer comprises a nitride.
7. A method as recited in claim 6, wherein the spacer is removed by wet chemistry.
8. A method as recited in claim 5, wherein the source/drain regions are formed by epitaxy.
9. A method as recited in claim 5 wherein the halo implantation comprises an approximately vertical implant to a depth of approximately 40 nm to 100 nm of ions selected from the group consisting essentially of  $B^+$ ,  $BF_2^+$ ,  $Ga^+$ ,  $In^+$ ,  $As^+$ ,  $Sb^+$ ,  $P^+$ .
10. A method of making a MOSFET, comprising:  
providing a substrate having a gate oxide and gate thereon;  
performing an approximately vertical source/drain extension implant to a depth of approximately 10 nm to approximately 30 nm;  
forming a nitride spacer on the gate;  
performing epitaxy to form raised source/drain regions;  
forming a silicide on the gate and source/drain regions;  
removing the spacer;  
performing an approximately vertical halo implant to a depth of approximately 40

nm to approximately 100 nm; and

completing the MOSFET.

11. A method as recited in claim 10 wherein the halo implantation comprises implantation of ions selected from the group consisting essentially of  $B^+$ ,  $BF_2^+$ ,  $Ga^+$ ,  $In^+$ ,  $As^+$ ,  $Sb^+$ ,  $P^+$ .



## UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
09/844,752	04/27/2001	2812	710	P1316	5	20	3

CONFIRMATION NO. 2099

## FILING RECEIPT



\*OC000000006221228\*

LaRiviere, Grubman & Payne, LLP  
 P.O. Box 3140  
 Monterey, CA 93942

Date Mailed: 06/25/2001

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

## Applicant(s)

Bin Yu, Sunnyvale, CA;

## Domestic Priority data as claimed by applicant

## Foreign Applications

If Required, Foreign Filing License Granted 06/23/2001

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

## Title

MOS transistor with highly localized super halo implant

## Preliminary Class

438

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